

REMARKS

The application has been amended and is believed to be in condition for allowance.

A copy of the preliminary amendment and the stamped postcard receipt is attached.

As shown, the claims all should have been examined. If the case is not now in condition for allowance, another non-final action is solicited.

The specification has been amended, responsive to the formal objections, to add section headings and to indicate that the application is a National Stage.

Claims 1-2, 5-7, and 9 were rejected as anticipated by MAGILL 6,774,643.

Claims 3-4 were rejected as obvious in further view of YARMCHUK 5,469,051; claim 8 in further view of UCHIDA 3,895,376; claim 10 in further view of HARRISON 3,859,654; claim 11 as obvious over MAGILL; and claim 12 in further view of LIMA et al. 5,949,247.

Subject matter from prior claim 9 has been moved to claim 1. Otherwise, only formal amendments were made.

New claim 13 is based on amended claim 1 and is included in the below discussion.

The claims recite the present invention and are directed to an acquisition module particularly comprising an analogue-to-digital converter (ADC). Advantageously, inputs of

the converter are of the differential type with a reference input and a conversion input. The recitation is "said analogue-to-digital converter comprising differential inputs, a reference input supplied with a voltage taken at the terminals of said reference impedance and a conversion input supplied with a voltage taken via the input connector at the sensor terminals."

Thus, according to the invention and the claims, the reference voltage required for the reference input of the ADC consists of the voltage at terminals of the impedance, and the conversion input receives voltage from the sensor.

With such an implementation, the transfer function of the ADC is simplified.

With the present invention, the current which passes through the measurement branch (I_{mes}) is the same as the one (I_{ref}) which passes through the reference resistor.

Moreover:

$V_{ref} = R * I_{ref}$ - voltage present at the terminals of the reference resistor and measured by the reference input of the analogue-to-digital converter.

Similarly at the terminals of the sensor:

$$V_{mes} = R_{sensor} * I_{mes}$$

It being understood that:

$$I_{mes} = I_{ref}$$

Consequently, as the converter produces at the output:

$$S = K V_{mes}/V_{ref} ==> S = K * R_{sensor}/R$$

$$\text{or } S = K1 R_{\text{sensor}},$$

the measurement is therefore not dependent on the supply voltage or on the measurement current (K and K1 are two coefficients).

On the contrary, the system described in MAGILL produces a signal which is dependent on the supply voltage. See, for example, column 10, lines 39-45: "When the current generated by the signal generator 44 is received by the capacitor 20, a voltage response from the capacitor is provided to the amplifier 64 via cable 36 and the positive amplifier input 70. The amplifier 64 amplifies the voltage received from the capacitor 20 by, e.g., 100 times, and provides a corresponding amplified signal output to the user computational device 48 via line 74 and cable 52."

In other words, the present invention concerns a module equipped with a ADC. The ADC comprises a reference input receiving the voltage at the resistor reference. The ADC comprises a conversion input receiving the voltage to be converted with the aid of reference voltage.

Applicant finds no disclosure in MAGILL describing such an implementation of an analogue-to-digital converter. Indeed, MAGILL relates to an analog to digital converter without pointing out how the converter is implemented. See:

- Column 10, lines 50-52: "Thus, an analog to digital converter (not shown) is also included in the present invention."

- Column 13, lines 9-14: "Accordingly, upon amplification of the impedance sensor 28 output signals by the amplifier 64, and subsequent conversion of the amplified signals to digital data by an analog to digital converter, the resulting digital impedance related values is transmitted to and stored in the data acquisition device 78."

Moreover, consider on page 5 of the Office Action, that: "MAGILL discloses analogue-to-digital converter having differential input 64 (Fig 1)".

Applicant is of a different opinion. Indeed, Figure 1 clearly describes an amplifier as element 64 and not an analogue-to-digital converter. See column 10, lines 50-52, and column 13, lines 9-14. Thus, amplifier 64 cannot be considered as an analogue-to-digital converter.

Thus, MAGILL does not disclose a converter as implemented in claim 1 of the present invention.

Claim 1 is thus not anticipated.

Claim 1 is also non-obvious.

HARRISON describes a Delta-zigma converter with a reference voltage V_r . But it does not describe the implementation as defined in claim 1 of the present invention.

Moreover, the combination between MAGILL and HARRISON does not lead to the present invention because none of both documents discloses the fact that the reference voltage V_r has to

be taken at the terminals of a resistor which is in series with the supply voltage and the sensor.

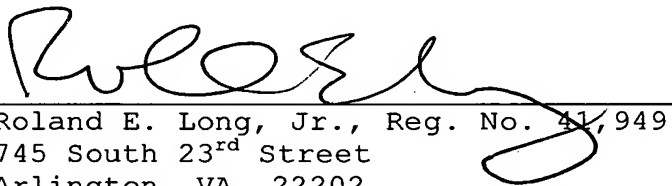
As a result, the device defined in new claim 1 is different from MAGILL and results in a different, much more efficient and effective conversion from analog to digital.

In summary, the pending claims are believed to be both novel and non-obvious over the prior art. Accordingly, reconsideration and allowance of all the pending claims are respectfully requested.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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APPENDIX:

The Appendix includes the following items:

- copy of Preliminary Amendment filed August 17, 2004 and
postcard receipt evidencing such filing



INT. APPLN. # PCT/FR2003/000516

Docket No. **0501-1101**

ATTACHED IS A NEW NATIONAL PHASE APPLICATION OF

INVENTOR(S): Alain PASTY

TITLE: ACQUISITION MODULE WITH A UNIVERSAL INPUT FOR THE MEASUREMENT OF PHYSICAL PARAMETERS

FILING DATE: August 17, 2004

CONSISTING OF:

- | | | | |
|-------------------------------------|---|-------------------------------------|--|
| <input checked="" type="checkbox"/> | Transmittal Letter (PTO-1390) | <input checked="" type="checkbox"/> | SMALL ENTITY CLAIM |
| <input type="checkbox"/> | Published Application (English) | <input checked="" type="checkbox"/> | English Translation |
| <input checked="" type="checkbox"/> | PCT/IB/308 | <input checked="" type="checkbox"/> | Coversheet of Publication |
| <input checked="" type="checkbox"/> | 3 Sheets Of Drawings | <input checked="" type="checkbox"/> | Abstract |
| <input checked="" type="checkbox"/> | Application Data Sheet | <input checked="" type="checkbox"/> | Preliminary Amendment |
| <input checked="" type="checkbox"/> | Executed declaration (1) | <input checked="" type="checkbox"/> | Exec. Assignment w/PTO-1595 |
| <input type="checkbox"/> | Paper Sequence Listing | <input type="checkbox"/> | Computer readable Seq. List. (diskette) |
| <input type="checkbox"/> | Not. of Sub. of Sequence Listing | <input type="checkbox"/> | Article 19 Amendments |
| <input type="checkbox"/> | International Preliminary Examination Report (PCT/IPEA/409) | <input type="checkbox"/> | |
| <input type="checkbox"/> | Amended sheets w/IPER | <input type="checkbox"/> | |
| <input type="checkbox"/> | Info. Disclosure Statement w/1449 | <input type="checkbox"/> | International Search Report |
| <input type="checkbox"/> | Cited References | <input checked="" type="checkbox"/> | Check # <u>30056</u> for \$500.00 |

Other: _____

USPTO - PLEASE STAMP RECEIPT DATE AND APPLICATION NUMBER

Actual due date: 8/18/2004

BC/yr



Docket No. 0501-1101

PATENT
0501-1101

IN THE U.S. PATENT AND TRADEMARK OFFICE

In re application of

Alain PASTY

Conf.

Application No. NEW NATIONAL PHASE

Group

Filed August 17, 2004

Examiner

ACQUISITION MODULE WITH A UNIVERSAL INPUT FOR THE MEASUREMENT OF
PHYSICAL PARAMETERS

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

August 17, 2004

Sir:

The following preliminary amendments and remarks are respectfully submitted in connection with the above-identified application.

Amendments to the Specification begin on page 2 of this paper.

Amendments to the Claims are reflected in the listing of claims which begin on page 3 of this paper.

Remarks begin on page 6 of this paper.

An Appendix is attached following the signature page of this paper.

AMENDMENTS TO THE SPECIFICATION:

Please cancel the originally-filed Abstract of the Disclosure, and add the accompanying new Abstract of the Disclosure which appears on a separate sheet in the Appendix.

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1.(original) Acquisition module for the measurement of physical parameters, comprising at least one analogue-to-digital converter and at least one input connector capable of receiving a sensor, characterized in that it also comprises a supply source and a reference impedance arranged in series between said supply source and a terminal of the input connector; and in that said analogue-to-digital converter comprises a reference input supplied with a voltage taken at the terminals of said reference impedance and a conversion input supplied with a voltage taken via the input connector at the sensor terminals, and in that it also comprises means for delivering an image of the physical parameter measured by the sensor.

2.(original) Acquisition module according to claim 1, characterized in that it comprises a memory for storing parameters and variables.

3.(currently amended) Acquisition module according to claim 1 [[or 2]], characterized in that it consists of a card which can be plugged into a processing unit such as a microcomputer.

4.(original) Acquisition module according to claim 3, characterized in that the supply source originates from the processing unit.

5. (currently amended) Acquisition module according to ~~any one of claims 1 to 3~~ claim 1, characterized in that the supply source is internal to the analogue-to-digital converter.

6. (currently amended) Acquisition module according to ~~any one of the preceding claims~~ claim 1, characterized in that the supply source is programmable.

7. (currently amended) Acquisition module according to ~~any one of the preceding claims~~ claim 1, characterized in that it comprises processing means capable of processing the digital data originating from the analogue-to-digital converter in order to determine a value of the physical parameter measured.

8. (currently amended) Acquisition module according to ~~any one of the preceding claims~~ claim 1, characterized in that it comprises means for protection against overvoltage arranged between the analogue-to-digital converter on the one hand and the reference resistor and the connector on the other.

9. (currently amended) Acquisition module according to ~~one of the preceding claims~~ claim 1, characterized in that the analogue-to-digital converter is of the differential input type.

10. (original) Acquisition module according to claim 9, characterized in that the analogue-to-digital converter consists of a Delta-Sigma converter.

11. (currently amended) Acquisition module according to ~~any one of claims 1 to 8~~ claim 1, characterized in that the analogue-to-digital converter is of the common mode input type; and in that it comprises a first differential amplifier arranged between the reference input and the reference impedance and a second

differential amplifier arranged between the conversion input and the sensor.

12. (currently amended) Acquisition module according to ~~any one of the preceding claims~~ claim 1, characterized in that it comprises a plurality of acquisition channels.

REMARKS

Claims 1-12 remain in this application.

Entry of the above amendments is earnestly solicited. An early and favorable first action on the merits is earnestly requested.

Should there be any matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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APPENDIX:

The Appendix includes the following item(s):

- ☒ - a new or amended Abstract of the Disclosure
- ☐ - a Replacement Sheet for Figure of the drawings
- ☐ - a Substitute Specification and a marked-up copy of the originally-filed specification
- ☐ - a terminal disclaimer
- ☐ - a 37 CFR 1.132 Declaration
- ☐ - a Substitute Specification and a marked-up copy of the originally-filed specification
- ☐ - a verified English translation of foreign priority document